Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES
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<u>Ex parte</u> KEITH JAMES HANNA, PETER J. BURT, SCHMUEL PELEG,
DOUGLAS F. DIXON, DEEPAM MISHRA, LAMBERT E. WIXSON,
ROBERT MANDLEBAUM, PETER COYLE and JOSHUA R. HERMAN
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Appeal No. 2001-1230
Application No. 08/759,346
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ON BRIEF
_____

Before HAIRSTON, LEVY, and SAADAT, <u>Administrative Patent Judges</u>.

SAADAT, <u>Administrative Patent Judge</u>.

<u>DECISION ON APPEAL</u>

This is a decision on appeal from the Examiner's final rejection of claims 1-16, which are all of the claims pending in this application.

We reverse.

<u>BACKGROUND</u>

Appellants' invention is directed to a system that obtains and analyzes images of an object in a scene. The system uses a wide field of view (WFOV) imager for locating the object in a captured image of the scene and a narrow field of view (NFOV)

imager for capturing the image of the object. The NFOV imager is

responsive to the location information provided by WFOV imager

and has a higher resolution than the WFOV imager.

Representative independent claim 7 is reproduced below:

7. A fully automatic object recognition system which
obtains and analyzes images of at least one object in a
scene comprising:

a wide field of view imager which is used to capture an
image of the scene and to locate the object; and

a narrow field of view imager, distinct from the wide
field of view imager, which is responsive to the location
information provided by the wide field of view imager and
which is used to capture an image of the object, the image
captured by the narrow field of view imager having a higher
resolution and a narrower field of view than the image
captured by the wide field of view imager.

The Examiner relies on the following references in rejecting

the claims:

Flom et al. (Flom)   4,641,349   Feb. 3, 1987
Tomono et al. (Tomono)   5,016,282   May 14, 1991
Holeva   5,365,597   Nov. 15, 1994

Claims 1, 7-9 and 11-16 stand rejected under 35 U.S.C.

§ 103(a) as being unpatentable over Holeva in view of Flom.

Claims 2-6 and 10 stand rejected under 35 U.S.C. § 103(a) as

being unpatentable over Holeva and Flom and further in view of

Tomono.

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We make reference to the answer (Paper No. 21, mailed April
11, 2000) for the Examiner's reasoning, and to the appeal brief
(Paper No. 19, filed December 2, 1999) and the reply brief (Paper
No. 23, filed June 14, 2000) for Appellants' arguments
thereagainst.

<div align="center">OPINION</div>

With respect to the rejection of claims 1, 7-9 and 11-16,
the Examiner characterizes the low-resolution and the high-
resolution cameras in Figure 1 of Holeva as the wide field of
view imager and the narrow field of view imager respectively
(answer, page 3). The Examiner further relies on Flom for
disclosing a recognition system for identification by obtaining
an image of the iris of the eye of a human. By pointing to the
high resolution camera of Holeva that determines the profile of
the package surface, the Examiner concludes that combining the
teachings of Holeva and Flom would have been obvious to one of
ordinary skill in the art (id.).

Appellants argue that the low resolution cameras obtain
images of the top of the package for determining the distance
between the cameras and the top of the package instead of
locating an object in the scene (brief, page 8). Appellants
further point out that the high resolution camera obtains an

image of the entire top of the package using the distance and the

focus information provided by the low resolution cameras (id.).

Additionally, Appellants indicate that Holeva does not disclose a

narrower field of view for the high resolution camera and

instead, implies that the high resolution camera must have at

least the same field of view as that of the low resolution

cameras to insure that an image of the label is captured (brief,

pages 8 & 9 and reply brief, page 2). Referring to Flom,

Appellants argue that the reference merely discloses an iris

recognition system that captures a high resolution image of the

eye to be compared with a stored image and has nothing to do with

the claimed wide field of view and narrow field of view imagers

(brief, page 9).

    In response to Appellants' arguments, the Examiner asserts

that the low resolution and high resolution cameras of Holeva

have wide field of view and narrow field of view respectively

(answer, page 11). The Examiner further reasons that the claims

do not recite "capturing a narrow field of view image that

contains the label" and states that:

> . . . the claims only recite "capturing a narrow field of
> view imager, distinct from the wide field of view imager,
> which is used to capture an image of the eye, the image
> captured by the narrow field of view imager having a higher
> resolution and a narrower field of view than the image

captured by the wide field of view than the image captured
by the wide field of view imager."
(answer, page 15).

The Examiner relies on the characterization of the cameras of

Holeva as having wide and narrow fields of view and points out

that the narrow field of view imager 110 focuses on the label on

a package and generates a high resolution image (answer, pages 15

and 16).

The initial burden of establishing reasons for

unpatentability rests on the Examiner. In re Oetiker, 977 F.2d

1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The Examiner

must produce a factual basis supported by teaching in a prior art

reference or shown to be common knowledge of unquestionable

demonstration, consistent with the holding in Graham v. John

Deere Co., 383 U.S. 1, 148 USPQ 459 (1966). Our reviewing court

requires this evidence in order to establish a prima facie case.

In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88

(Fed. Cir. 1984); In re Cofer, 354 F.2d 664, 668, 148 USPQ 268,

271-72 (CCPA 1966). However, "the Board must not only assure

that the requisite findings are made, based on evidence of

record, but must also explain the reasoning by which the findings

are deemed to support the agency's conclusion." In re Lee, 277

F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

First, to address the Examiner's assertion that the claims
do not recite "capturing a narrow field of view image that
contains the label," we note that the claims require that the
image of the scene be captured by the wide field of view camera
whereas the image of the object in the scene is captured by the
narrow field of view camera. Therefore, if the image of the top
surface of the package captured by the low resolution cameras of
Holeva can be similar to the claimed wide field of view image of
the scene, the high resolution image of the object must be the
image of the label. Thus, the analysis should be directed to
determining whether the camera for capturing the high resolution
image of the label necessarily has a narrower field of view than
the low resolution cameras.

Our review of Holeva confirms that the reference relates to
a method and an apparatus for determining the range of objects
and for focusing a camera. As depicted in Figure 1, low-
resolution cameras 104 generate two images, having different
focal gradient, from the top of package 112 as the package is
moved on conveyor belt 102 (col. 4, lines 24-29). The images are
processed by focus sensing processor 106 to calculate the focus
distance for high-resolution camera 110 (col. 4, lines 30-35)
which generates a high-resolution image of the top of the package

to be used by label reader 108 (col. 4, lines 36-39). Holeva

further describes the high-resolution camera as:

>   Camera 110 may be a conventional high-resolution,
> variable-focus camera and is preferably a 4096-pixel CCD
> line-scan array to enable perception of details on package
> labels.
> (Col. 4, lines 40-43).

Holeva further describes the low-resolution cameras as follows:

>   The specific characteristics of the optical components
> of optical system 114 of dual-camera optics 104 depend on
> the particular application and may be selected empirically.
> (Col. 5, lines 5-8).
>
> The specific component characteristics described below apply
> to a preferred embodiment of the present invention designed
> to provide a depth-of-view of approximately 24 inches and a
> field-of-view of approximately 18 inches. (Col. 5, lines
> 11-15).
>
> Array 212 and 218 may be conventional CCD line-scan arrays
> and are preferably 256-element CCD line scan arrays. In a
> preferred embodiment, camera 206 has a f-number of 12.5 and
> camera 208 has an f-number of 1.25. In alternative
> preferred embodiments, f-numbers for cameras 206 and 208 are
> selected to provide an f-number ratio of greater than 10.
> (Fig. 2 and Col. 5, lines 25-31).

Therefore, Holeva provides no information regarding the relative

field-of-view of the low-resolution and high-resolution cameras

104 and 110 and is merely concerned with the resolution of the

cameras. Although camera 110 has a higher resolution, it still

captures an image of the top of the package based on the distance

rather than the position of the label on the top surface of the

package. In fact, as pointed out by Appellants (brief, pages 8

and 9), the field of view of the high resolution camera must be

at least the same as the low resolution camera in order to

capture the image of <u>entire top of the package</u> to cover all the

portions that may contain a label.

Flom, on the other hand, relates to identifying an eye from

the visible features of the iris by obtaining an image of the

iris and comparing the image with the stored image information

(Fig. 2 and col. 4, line 59 through col. 5, line 2). Although

Flom mentions using one or more cameras or laser-based techniques

for obtaining an image of the iris (Fig. 10 and col. 11, lines

15-22), no further reference is made to the field of view or

relative resolution of the camera.

Thus, we agree with Appellants that the combination of

Holeva and Flom fails to teach or suggest a wide field of view

camera to capture an image of the scene and locate the object and

a narrow field of view camera to capture an image of the object.

As discussed above, none of the references discloses that the

image captured by the narrow field of view camera has <u>both a</u>

<u>higher resolution and a narrower field of view</u> than the image

captured by the wide field of view camera, as required by

independent claims 1 and 7. Although we might have disagreed

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with Appellants' arguments related to the difference between locating an object in a scene and determining the distance of an object, we do not need to reach this issue. We merely note that the focus sensing processor 106 of Holeva indeed locates the top of the package by determining the distance between the low resolution camera and the top of the package.

Thus, assuming, arguendo, that it would have been obvious to combine Holeva with Flom, as held by the Examiner, the combination would still fall short of teaching a wide field of view camera to capture an image of the scene and locate the object and a narrow field of view camera to capture an image of the object based on the location information provided by the wide field of view camera. We note that, similar to claims 1 and 7, independent claims 11 and 15 recite using wide field of view and narrow field of view imagers while claims 14 and 16 require a coarse resolution imager to capture an image of the scene and locate the object and a fine resolution imager to capture an image of the object responsive to location information from the coarse resolution imager. Therefore, as the Examiner has failed to set forth a prima facie case of obviousness, we cannot sustain the 35 U.S.C. § 103 rejection of claims 1, 7-9 and 11-16 over Holeva and Flom.

With respect to the rejection of claims 2-6 and 10, the Examiner further relies on Tomono for teaching an apparatus for capturing images of the iris of two eyes to detect eye movements (answer, page 8). However, Tomono provides no teaching related to the claimed use of wide field of view and narrow field of view cameras to capture an image of the object based on the location information provided by the wide field of view camera and fails to overcome the deficiencies of Holeva and Flom as discussed above. Therefore, the 35 U.S.C. § 103 rejection of claims 2-6 and 10 cannot be sustained.

CONCLUSION

In view of the foregoing, the decision of the Examiner

rejecting claims 1-16 under 35 U.S.C. § 103 is reversed.

REVERSED

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            KENNETH W. HAIRSTON          )
            Administrative Patent Judge  )
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                                         ) BOARD OF PATENT
            STUART S. LEVY               )     APPEALS
            Administrative Patent Judge  )       AND
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            MAHSHID D. SAADAT            )
            Administrative Patent Judge  )
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Ratnerprestia
P.O. Box 980
Valley Forge, PA 19482-0980